

FIRST RECORD OF CUSCUTA CHINENSISLAM. (CONVOLVULACEAE) IN THE SIKKIM EASTERN HIMALAYA

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ABSTRACT

The Eastern Himalayas host a variety of Cuscuta species (Convolvulaceae); however, their diversity and ecology have yet to be explored. We are reporting Cuscuta chinensis Lam. for the first time in Sikkim, India as well as ecological notes pertaining to the status of this parasitic genus in Sikkim.

KEYWORDS: Cuscuta, Parasite, Sikkim, Himalaya, India

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INTRODUCTION

Cuscuta (Convolvulaceae) is a genus of holoparasitic herb with a cosmopolitan distribution throughout tropical and south-temperate biomes. Comprising 150 to 200 species (Yunker 1932), this genus can infect nearly every dicotyledonous plant family, consequently making them a threat to agricultural system productivity throughout much of developing world (Rajbhandari and Joshi 1998). Cuscuta infects its host via specialized organs termed haustoria (singular haustorium) that fuse host-parasite vascular tissues together. Through these organs, these plants obtain all of their mineral nutrients, carbohydrates, and water.

Lacking roots and leaves at maturity, few morphological characters exist to differentiate Cuscuta spp. from each other. As such, diversity data on these plants remain largely deficient particularly in understudied regions of Asia. Our article addresses this disparity by reporting the first record of Cuscuta chinensis Lam. from the Sikkim Eastern Himalaya and providing ecological notes for all members of this genus native to Sikkim.

METHODS

Botanical notes and observations on Cuscuta spp. were recorded during systematic transect walks from August through December 2015. Coordinate data and photographs were collected for each individual Cuscuta encountered using GalileoPro (2015) and, when permitted, herbarium records submitted to the Botanical Survey of India (Figure 1). For identification purposes, we consulted herbarium records located at the National Herbarium and Plant Laboratories (Godawari, Kathmandu, Nepal) and consulted scientists both at the Botanical Survey of India as well as Tribhuvan University (Kirtipur, Kathmandu, Nepal). Using ArcGIS Version 9.3 with Map Source Software (ESRI 2011) and Microsoft Excel (2010), we then mapped distributional, altitudinal, and phenological data for each species based on our primary observations and herbarium consultations.

RESULTS & CONCLUSIONS

In total, three *Cuscuta* species were reported from Sikkim: 1) *Cuscuta chinensis* Lam.; *Cuscuta europaea* Engelm.; and *Cuscuta reflexa* Roxb. *Cuscuta chinensis* Lam. (n=5) were reported for the first time in Sikkim (Legship, South District; 875 m ASL) parasitizing herbaceous plants in the Amaranthaceae, Asteraceae, Polygalaceae, and Urticaceae (Figure 2). Known locally as akaashbeli, this species has yellow-orange tendrils (1 mm) and laterally arranged hermaphroditic white flowers with white corollas, two uneven styles, and globose stigmas that distinguish it from *C. europaea* and *C. reflexa* that were both observed and reported during our survey (Figure 2). *C. europaea* specimen (n=23) were observed parasitizing both woody and non-woody taxa in the Asteraceae, Berberidaceae, Fagaceae, Malvaceae, Rutaceae, and Urticaceae; *C. reflexa* (n=14) was observed parasitizing similar species in Balsaminaceae, Berberidaceae, Lamiaceae, and Malvaceae. All *Cuscuta* species surveyed have similar phenological events (Table 1) and altitudinal ranges (Figure 3).

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APPENDICES

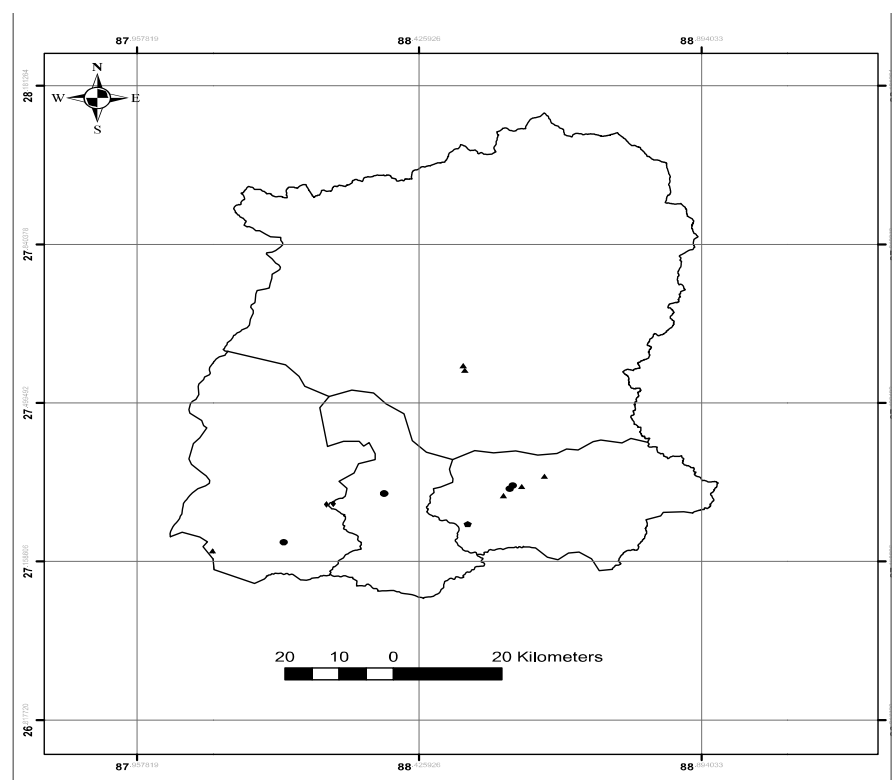


Figure 1: *Cuscuta* Populations observed in Sikkim Eastern Himalaya. ◆ *Cuscuta Chinensis*; ■ - *Cuscuta Reflexa* Var. *Reflexa*; Δ – *Cuscuta Europaea* Var. *Indica*; ■ - *Cuscuta Europaea* Var. *Anguina*

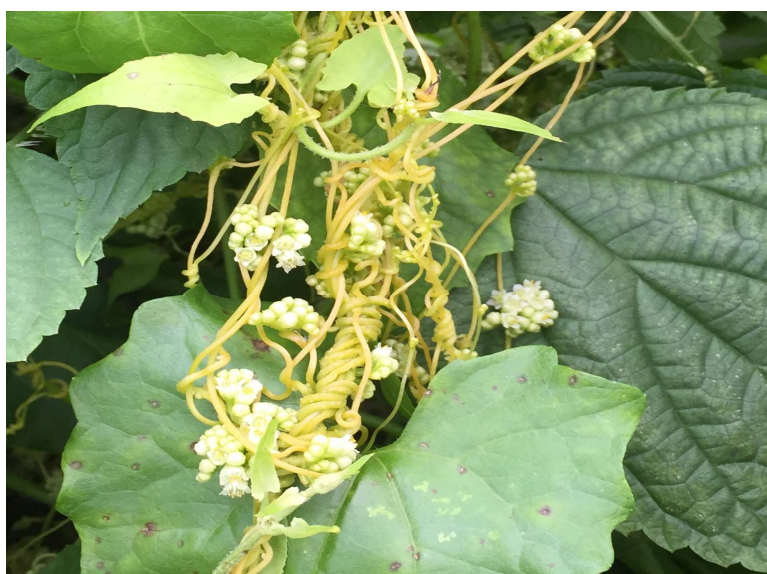


Figure 2: Flowering and Fruiting *Cuscuta Chinensis* Lam. Collected Near Legship, South District, Sikkim (Latitude: 27.281167, Longitude: 88.274439) during October 2015

Table 1: Phenological Data for *Cuscuta* Spp. Native to the Sikkim Eastern Himalaya Based on Both Observation and Herbarium Consultation at the Botanical Survey of India (Zero Point, Gangtok) and National Herbarium and Plant Laboratories (Godawari, Kathmandu)

Species	Character	Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
<i>Cuscuta Chinensis</i> Lam.	Flower												
	Fruit												
<i>Cuscuta Europaea</i> Var. <i>Indica</i> Engeim	Flower												
	Fruit												
<i>Cuscuta Reflexa</i> Var. <i>Anguina</i> Engeim	Flower												
	Fruit												
<i>Cuscuta Reflexa</i> Var. <i>Reflexa</i> Roxb	Flower												
	Fruit												

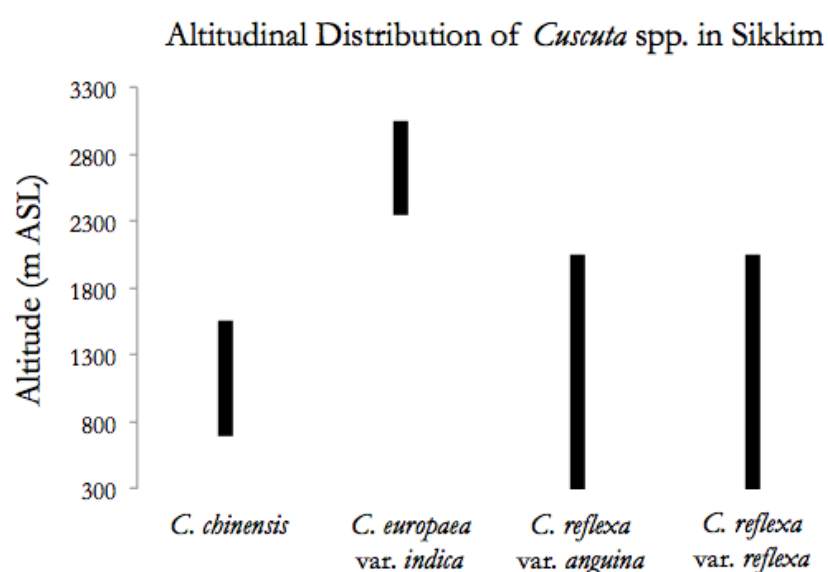


Figure 3: Altitudinal Distribution of *Cuscuta* Spp. Native to the Sikkim Eastern Himalaya